

REMARKS/ARGUMENTS

Reconsideration of this application is respectfully requested.

Specification

The Examiner has referred to 37 CFR 1.77(b), Arrangement of application elements. The Examiner indicates that section headings (a)-(l) should be provided in the specification in uppercase without underlining or bold type as a section heading whether or not a section text actually follows. The Examiner suggests that if no text follows, the phrase "Not Applicable" should follow the section heading.

The Examiner is requested to reconsider his requirement. 37 CFR 1.77(c) states that the text of the specification sections defined in paragraphs (b)(1)-(b)(12) of 37 CFR 1.77, if applicable, should be proceeded by a section heading in uppercase without underlining or bold type (underlining added). This is not the same as saying that all of the section headings defined in paragraphs (b)(1)-(b)(12) must appear in the specification, and if no text follows, should be followed by the words "Not Applicable."

It is believed that the inclusion of all twelve section headings in the application, although no text will follow many of the headings, will create confusion and clutter in the application. In that it is the purpose of the application to clearly present the subject matter of the invention, it is believed that adherence to the suggestion proposed by the Examiner would have the opposite effect of confusing the subject matter of the specification.

This Amendment changes the section headings already appearing in the application to appear in uppercase without bold or underlining, and adds section headings

to those sections which had no heading. The Examiner's approval of this response in view of the remarks given above is requested.

In paragraph 45 of the specification, Fig. 6 has been changed to Fig. 7. The Examiner is thanked for pointing out this error in the specification.

Claim Rejection 35 USC § 112

Claims 15-19 are rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly claim out and distinctly claim the subject matter which applicant regards as the invention. The Examiner has stated that there is no antecedent basis for the language "the same part."

This Amendment changes the language "the same part" to "identical parts."

Claim Rejections 35 USC § 103

Claims 1, 2, 3, 4, 13 and 14 have been rejected under 35 USC § 103(a) as being unpatentable over Lambert et al 5,044,125 in view of Sigg 4,637,169. This rejection is respectfully traversed.

The Examiner states that Lambert discloses a method for controlling a grinding process including a force transducer 22 mounted adjacent the wheel head 14 to measure a magnitude of a normal force factor occurring between the wheel 17 and the workpiece. Lambert discloses a watt transducer 29 for determining wheelhead power consumption.

The Lambert device is not at all the same as applicant's device as disclosed and claimed. Lambert relies on a separate load cell 22 to monitor wheelhead force. As disclosed, load cell 22 consists of a set of piezoelectric force rings mounted under the grinding wheelhead 14 and the spindle 25 for measuring grinding forces.

In applicant's device, no separate elements are required to measure normal forces

between the grinding wheel and the workpiece. Applicant has determined that an indication of the normal grinding force between the wheel and the workpiece can be obtained by measuring the power demand made by the wheelfeed drive motor. Applicant has determined by measuring the power demand made by the wheelfeed drive motor, a signal proportional to torque developed by the motor is obtained. Further, the torque signal is proportional to the force exerted by the wheelfeed drive motor. Further, a signal indicative of the normal grinding force can be determined by measuring the force exerted by the wheelfeed drive. Thus, by measuring the power demand made by the wheelfeed drive, it is possible to monitor the wear of the grinding wheel. This is done by establishing a predetermined threshold value for the grinding force between the wheel and workpiece, and generating a warning signal when the threshold value is exceeded. Lambert shows no such device.

Lambert relies on a separate force sensor 22 to develop a signal for measuring grinding forces. Applicant's device requires no separate sensor. Such separate sensors are prone to malfunction and wear, leading to incorrect readings. Since applicant's device requires no separate elements, there is nothing to wear out and nothing to give incorrect readings.

The patent to Sigg fails to cure the deficiencies of Lambert et al. in providing a prior art basis on which to reject applicant's claims. The Examiner relies on Sigg to show a detector circuit to provide a control signal to a switch to provide a warning signal to an operator to stop a machine. However, Sigg does not cure the deficiencies of the Lambert reference. Sigg does not show, teach or render obvious the step of providing an indication of the normal grinding force between a wheel and a workpiece by measuring

the power demand made by the wheelfeed motor. In Sigg, acoustic transducers develop signals that are used to generate a warning signal. The acoustic signals come from separate acoustic transducers 9 and 10. Thus, Sigg teaches no more than Lambert, namely, that separate transducers or sensors must be used to generate signals in order to provide a warning concerning the operation of a machine.

For the foregoing reasons it is believed, that the rejection of claims 1, 2, 3, 4, 13 and 14 in this case under 35 USC 103(a) on the basis of Lambert et al in view of Sigg is untenable and should be withdrawn.

Allowable Subject Matter

The indication of allowable subject matter in claims 5-12 is noted with appreciation. The Examiner has indicated that these claims would be allowable if rewritten in independent form to include all of the limitations of the base claim and any intervening claims. Claim 5 has been rewritten as new claim 21 to include all of the limitations of rejected claims 1, 2, 3 and 4. Accordingly, it is believed that claim 21 in its present form should be allowable.

This amendment presents new claim 20 for the Examiner's consideration. Claim 20 contains the limitations of original claims 1, 2 and 5, and is believed to be allowable.

Claim 20 recites that an indication of the force between the wheel and the workpiece is obtained by measuring the power demand made by the motor on its power supply, that the value of the force proportional signal obtained during a grinding process on a workpiece is compared with a corresponding value obtained during the grinding process performed on a preceding similar workpiece, and that a warning signal is generated if a current grinding force signal value differs from a preceding grinding force

signal value by more than a predetermined amount.

The patents to Lambert et al and Sigg show no such device. As discussed above, Lambert requires the use of a separate force transducer in order to monitor the forces on the grinding wheel. Lambert does not teach that the force between the wheel and the workpiece can be obtained by measuring the power demand made by the wheelfeed motor on its power supply. Sigg does not cure the deficiencies of Lambert in that Sigg teaches that separate acoustic transducers have to be used to sense machine operation parameters.

Lastly, the Examiner has indicated that the step of comparing the value of the force proportional signal obtained during a grinding process on a workpiece with a corresponding value obtained during the grinding process performed on a preceding similar workpiece is not shown by the prior art. Thus for the reasons stated above, it is believed that claim 20 is not taught, shown or rendered obvious by the cited prior art, and thus claim 20 should be allowable.

Claims 6, 7, 10, 13 and 14 have been rewritten to be dependent upon claim 20, and since claim 20 should be allowable, these dependent claims should also be allowable.

Remaining original claims 8, 9, 11, and 12 are dependent upon claims that are now dependent upon claim 20.

It is noted that minor changes have been made to claims 8, 9 and 15 to improve the grammar thereof.

Claims 22, 23 and 24 are submitted for the Examiner's consideration. These claims present the subject matter of original claims 1, 2 and 5 in a way to more positively recite the subject matter which applicant believes to be his invention. It is believed that

claims 22-24 define subject matter not found in the prior art.

In particular, Claim 22 contains the step of obtaining a signal proportional to the torque developed by the electric motor (that advances the grinding wheel) by measuring the electrical power drawn by the electric motor during operation, whereby an indication of the normal grinding force between the wheel and workpiece can be obtained by measuring the power demand made by the motor on its power supply.

Claim 23 contains the step of comparing the value of the present force signal obtained during a grinding process on a workpiece with a corresponding preceding force signal obtained during the grinding process performed on a preceding similar workpiece.

Claim 24 contains the step of comparing the value of the signal indicative of force obtained during a present grinding process on a workpiece with a corresponding signal obtained during a previous grinding process performed on a preceding similar workpiece and generating a warning signal if the current signal indicative of force differs from a preceding signal indicative of force by more than a predetermined amount.

None of the steps of claims 22-24 recited above are shown, taught, or rendered obvious by the prior art, and thus claims 22-24 should be allowable.

Additional Prior Art

The additional prior art cited by the Examiner but not used in a prior art rejection of the claims has been reviewed with interest. However, taken alone or in combination, the additional prior art does not teach, show, or render obvious applicant's invention as claimed.

Conclusion

For the foregoing reasons it is believed that this Amendment places the claims

now appearing in this case in condition for allowance, and an early notice to such effect is respectfully solicited.

In the event that the Examiner does not agree that the claims are now in condition for allowance, he is courteously invited to contact the undersigned at the number given below in order to discuss any changes which the Examiner believes would lead to an allowance of the claims.

It is believed that there will be new fees necessitated by the entry of this amendment. In the event that any new fees or charges are required, authorization is hereby given to charge such fees to applicant's Deposit Account No 50-0852.

Respectfully submitted,

REISING, ETHINGTON, BARNES, KISSELLE, P.C.



Brian L. Ribando
Registration No. 27,109
P.O. Box 4390
Troy, Michigan 48099
(248) 689-3500

Date: March 17, 2006